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EXAMINER	
CORDRAY, DENNIS R	

ART UNIT	PAPER NUMBER
1731	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/522,051	IMELAINEN, KEIJO	
	Examiner	Art Unit	
	Dennis Cordray	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, see pp 9-11, filed 3/19/2007, with respect to the rejection(s) of claim(s) 1-27 under 35 U.S.C. 103(a) over Cardin et al in view of others have been fully considered and are persuasive. Cardin et al does not teach or suggest a soda recovery boiler although the functions of recovering chemicals and heat in multiple process components are taught. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made as detailed below.

Examiner's Suggestion

The Examiner suggests changing the word "bark" in lines 7, 8 and 11 of Claim 19 to "dried bark" or "bark that has been dried" for clarity. The word "bark" in line 5 of Claim 19 should be changed to "wood bark," also for clarity.

Specification

The disclosure is objected to because of the following informalities: The disclosure uses the language "...process according to the preamble of Claim 1." (p1, par 1), and "...characterized by what is stated in the characterizing part of Claim 19." (p 7, pars 19-21). Since claims are subject to extensive modification, renumbering, and cancellation during the prosecution of the application, portions of the disclosure can be made non-enabling by the changes.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8, 13 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claims 8 and 15 recite the broad recitation "0.1 to 100 bar", and the claim also recites "2 to 14 bar" which is the narrower statement of the range/limitation.

Claim 13 recites the broad recitation "5 to 40%", and the claim also recites "10 to 15%" which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-5, 9-11, 13-14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saviharju et al (2004/0011484) in view of Kuusio et al (WO 93/11297) and Rundstrom (5226927).

Claims 1, 3, 5, 9-11 and 13: Saviharju et al teach that, in chemical pulp mills, wood bark is removed from logs, and the wood log is cut into chips and chemically processed (cooked or digested) to separate the fibers. The cooking chemicals are recovered from the waste alkaline cooking liquor, or black liquor, by firing the black liquor in a recovery boiler. Energy released in the recovery boiler is recovered as pressurized or superheated steam and used to produce electric power and low-pressure steam for other mill heating needs (p 1, pars 2 and 4). Saviharju et al discloses a modified process for producing energy at a pulp mill comprising (Abs; p 1, par 9):

- burning black liquor (cellulose pulp digestion liquor) from kraft pulping (i.e.-a sulfate pulp mill) in a recovery boiler and
- recovering heat from the flue gases produced in the form of saturated and partially superheated steam,

A combustible gas fuel is produced by gasifying bark, wood, wood chips, hogged wood, wood-based forest residues, then purifying the gas by removing the alkali components (ash) (p 1, par 10; pp 2-3, par 23).

Saviharju et al disclose that the wood material to be gasified is dried by flue gases from the recovery boiler (p 2, par 20).

Saviharju et al does not specifically recite digesting the wood material in a cooking liquor to separate the fibers, extracting the digested material as black liquor, or recovering the cooking chemicals from a soda recovery boiler, but the processes would have been obvious to one of ordinary skill in the art as a typical processes in a chemical pulp mill (p 1, par 2).

Saviharju et al does not disclose that the black liquor is concentrated by evaporation prior to being burned, that the bark or wood waste is dried to a moisture content below 30% prior to gasification, or that the combustible gas is burned in the recovery boiler.

Kuusio et al disclose a method of recovering energy from waste liquors from pulp processes by burning the waste liquor in a soda recovery boiler, recovering chemicals and recovering energy in the form of superheated steam (Abs; p 1, lines 6-12; p 5, lines 19-26; p 8, lines 32-35). Energy is also recovered as electrical energy (p 13, lines 33-35). The waste liquor is concentrated by evaporation to a dry solids content of about 80% (moisture content about 20%) before being sprayed into the recovery boiler (p 12, lines 29-34). A portion of the waste liquor is gasified to produce gas replacing fossil fuels to supply a separate superheating boiler for superheating the steam produced in the recovery boiler (p 6, lines 1-22). The waste liquor is concentrated prior to gasification to a dry solids content of up to 85% (15% moisture) to create a relatively good fuel and improving the economy of the gasifier and the soda recovery boiler (p 7, lines 15-31). The produced gas, after purification, can also be used as starting fuel in

the recovery boiler to replace purchased fuel (p 10, line 37 to p 11, line 1) and as fuel in a lime mud reburning kiln (p 13, lines 19-24).

Rundstrom discloses a wood gasifier for converting wood waste material into relatively tar free fuel gas without release of large quantities of air pollutants (Abs; col 2, lines 36-41). Drying the waste material to preferably less than 20% moisture content is preferable for continuous operation (col 8, lines 43-49). Grinding the wood pieces to sizes between about ½" to 8" is also preferable for continuous operation (col 8,lines 25-30).

The art of Saviharju et al, Kuusio et al, Rundstrom and the instant invention is analogous as pertaining to treatment of waste liquor and waste wood material in a pulp mill. It would have been obvious to one of ordinary skill in the art to use a portion of the gas generated by gasification of wood bark to fuel the recovery boiler in the process of Saviharju et al in view of Kuusio et al and Rundstrom to save on the cost of purchased fuel and minimize waste disposal. It would further have been obvious to concentrate the black liquor and the wood bark to the claimed moisture content to provide a better fuel for the recovery boiler and gasification process.

Claim 2: of Saviharju et al, Kuusio et al and Rundstrom do not disclose the amount of generated gas used in the recovery boiler. However, the amount of gas used in a combustion process is a result effective variable and it would have been within the capability of one of ordinary skill in the art to optimize the percentages of the generated gas required for operation of the recovery boiler, superheater and lime kiln.

Claims 4 and 17: Saviharju et al disclose that a portion of the generated gas is used in a superheating boiler that is separate from the recovery boiler (a two-part combustion chamber) (p 1, par 9; p 3, par 18; Fig. 1, items 14 and 18). The superheating boiler superheats the steam.

Claims 14 and 16: Saviharju et al disclose that the wood material can be dried by flue gases from the recovery boiler (p 2, par 20). While not explicitly disclosed, bringing the flue gas into direct contact with the waste wood would have been obvious to one of ordinary skill in the art. The flue gases are one source of surplus heat present at the pulp mill.

Claim 18: Saviharju et al disclose that a portion of the combustible gas is used to fuel a lime kiln to replace fossil fuels (p 2, pars 12 and 21).

Claims 6-8, 14-15, 19-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saviharju et al in view of Kuusio et al and Rundstrom as applied to claims 1-5, 9-11, 13 and 17 above, and further in view of O'Hagan et al (4627173).

Saviharju et al disclose that dried wood fuel, such as bark, is supplied as a feed (feed means) to the gasifier (Fig 1, items 12 and 10; p 2, pars 18-21). Saviharju et al also disclose a purifier attached to the gas outlet of the gasifier and a gas outlet from the purifier connected to a superheating boiler and to a lime kiln (Fig 1, items 44 and 46).

Saviharju et al, Kuusio et al and Rundstrom do not disclose the configuration of the dryer, its connection to the gasifier, the temperatures of the gases used in the dryer

or the use of steam. Saviharju et al, Kuusio et al and Rundstrom also do not disclose a connection from the gasifier to the recovery boiler.

O'Hagan et al disclose a fluidized bed dryer for particulized wet wood material or waste (i.e.-bark, wood chips, forest residues) using flue gases typically having a temperature of 400-600°F (204-315°C), and that the flue gases are cooled in the dryer to 160-250°F (71-121°C), which lies within the claimed ranges (Abs, col 1, lines 13-17; col. 6, lines 34-50; col 7, lines 36-38). Overheating of the wood is to be avoided (col 6, lines 17-18). O'Hagan et al also disclose that typically hog fuel or wet wood waste is dried to a 10-30% moisture content (col 5, lines 57-61). O'Hagan et al disclose that either steam or flue gas from a combustion source can be used for fluidizing and drying (Abs; col 1,lines 55-59; col 5, line 57 to col 6, line 1; col 7, lines 36-38). Using the drying gas to fluidize the bed inherently involves direct contact of the gas with the solids.

The art of Saviharju et al, Kuusio et al, Rundstrom, O'Hagan et al and the instant invention is analogous as pertaining to drying and gasifying waste wood. O'Hagan et al teaches that fluid or fluidized bed dryers are well known for the high rate of heat transfer between the gas and the fluidized particles as well as between bed particulates and surfaces immersed in the bed (col. 3, lines 18-21). It would have been obvious to a person of ordinary skill in the art to use a fluidized bed dryer as the drying apparatus in the process of Saviharju et al in view of Kuusio et al and further in view of O'Hagan et al to obtain a high rate of heat transfer and rapid drying of the bark. As discussed above, Saviharju et al discloses recovery of energy in the form of low pressure steam, which is available for other plant needs. Low pressure is construed by the Examiner to include

pressures near atmospheric, which lies within the claimed range. It would further have been obvious to use the claimed gas temperatures or to use available low pressure steam as the drying gas to avoid overheating the wood. A fluidized bed dryer has an ebullating bed.

Providing a feed means for the bark to be dried and an outlet means for the dried bark connected to the feed means of the gasifier would have been obvious. As discussed previously, it would have been obvious to use a portion of the generated gas to fuel the recovery boiler, thus supplying a gas outlet means connected to the feed unit of the recovery boiler would also have been obvious.

Regarding Claims 20 and 23-25, although the cited references do not expressly disclose two separate dryers, duplication of parts has no patentable significance unless a new and unexpected result is produced (see MPEP 2144.04 VI B). There is no evidence in the instant Specification of unexpected results obtained by using two dryers in the process. It would have been obvious to make each dryer of the same type (i.e.-fluidized bed dryer).

Alternatively, the dryer of O'Hagan et al is constructed to provide a plurality of sequential drying zones. The dried fines are removed from each zone before the partially dried coarser particles are transported to the next zone, thus providing a more consistent moisture content in both fine and coarse particles. The gas flow velocity in each zone is varied to provide the optimum amount of drying (col 4, line 50 to col 5, line 9; col 5, lines 26-56). It would have been obvious to one of ordinary skill in the art to provide the drying in separate dryers in the process of Saviharju et al in view of Kuusio

et al and Rundstrom and further in view of O'Hagan et al as a functionally equivalent option. The number of dryers required would have been determinable by one of ordinary skill in the art. It would have been obvious to make each dryer of the same type (i.e.-fluidized bed dryer). Connecting the outlet of one dryer to the feed unit of the next would also have been obvious.

Regarding Claims 21-22, Rundstrom discloses grinding the wood pieces to sizes between about ½" to 8" is also preferable for continuous operation of the gasifier (col 8, lines 25-30). It would thus have been obvious to include a grinding step before or between two dryers to obtain wood pieces of sizes between about ½" to 8" for continuous operation of the gasifier.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saviharju et al in view of Kuusio et al and Rundstrom as applied to claims 1-5, 9-11, 13 and 17 above and further in view of Berg (5103743).

Saviharju et al, Kuusio et al and Rundstrom do not disclose gasification of peat.

Berg teaches that bark, wood waste and peat are cheaper solid fuels used in heating of lime kilns (col 1, lines 49-51).

Saviharju et al, Kuusio et al, Rundstrom, Berg and the instant invention is analogous as pertaining to the use of waste wood for energy sources in pulp mills. It would have been obvious to one of ordinary skill in the art to use peat in the gasification process of Saviharju et al in view of Kuusio et al and Rundstrom and further in view of Berg as a well known and functionally equivalent option for inexpensive fuels.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRC

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